

REMARKS

The present amendment is submitted together with a Request for Continued Examination ("RCE") under 37 CFR §1.114 and an Information Disclosure Statement. With the present amendment, claims 1-2, 4-18 and 23-28 are pending in the application, including new claims 25-28.

In the Office Action, claims 1, 3 and 5 through 18 were rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent Publication No. 2004/0127045 to Gorantla et al. ("*Gorantla*") in view of U.S. Patent No. 6,913,517 to Prasad ("*Prasad*"). Claim 2 was rejected as being obvious over *Gorantla*, in view of *Prasad*, and further in view of U.S. Patent No. 6,316,365 to Wang et al. ("*Wang*"). Claims 22-24 were rejected as being obvious over *Gorantla* in view of *Prasad* and further in view of U.S. Patent Publication No. 2002/0043026 to Luo et al. ("*Luo*"). For the reasons set forth below, Applicants submit that the presently pending claims are fully distinguished from the combinations of references cited in the final Office Action. Reconsideration and withdrawal of the rejections are requested.

As amended herein, the presently pending claims define a method of polishing an oxide layer of a substrate in which a fixed abrasive pad is used with a fluid having a defined carbonate concentration to achieve an efficient rate of removal of the oxide layer without leaving the surface of the oxide layer scratched substantially. Applicants submit that the combination of references

cited by the Examiner fail to show that the invention recited in presently amended claim 1 is *prima facie* obvious.

Gorantla is cited by the Examiner as teaching the polishing of an oxide layer of a substrate using a fixed abrasive pad. However, *Gorantla* fails to teach use of a carbonate-containing liquid medium between the fixed abrasive pad and the substrate during polishing.

Prasad teaches use of a porous pad having abrasives and soluble particles embedded therein, the particles permitted to be of carbonate composition, among many others. (col. 9, lns. 4-27). However, *Prasad* makes no attempt to control a concentration of a carbonate ion in the liquid medium between the fixed abrasive pad and the substrate. In addition, *Prasad* does not attribute any effect on the oxide removal rate or scratch density to the presence of the carbonate.

Luo describes a method of polishing a substrate using a fixed abrasive pad and a polishing composition including polyalkyleneimine, e.g., polyethyleneimine ("PEI") (paragraphs [0007]-[0009], [0015]). *Luo* teaches that using the PEI containing composition produces "no visible scratches" on either an aluminum wafer or a TEOS oxide wafer (paragraph [0038]). However, *Luo* also teaches that using a polishing composition that does not contain PEI produces "many scratches" on both aluminum and TEOS oxide wafers, "due to high friction." (paragraph [0044]). *Luo* discovers a beneficial reduction in scratch

density by polishing with a composition containing PEI. However, *Luo* makes no such discovery in relation to a polishing with a carbonate-containing composition.

While *Luo* refers to a host of inorganic and organic compounds including carbonates that can be used as "inhibitors" in a polishing composition, *Luo* teaches none of the compounds as being an *alternative* to polyalkyleneimines. Rather, *Luo* teaches use of such compounds *only in addition* to a polyalkyleneimine. (paragraphs [0009], [0015], [0018], [0025], claim 1). Moreover, *Luo* specifies a maximum concentration for the "inhibitor" compound of 15% which exceeds applicants' specified maximum carbonate concentration (0.25 %; claim 1) by a factor of 60. Clearly, *Luo* neither teaches nor suggests use of a fluid having a carbonate concentration as defined in claim 1 to polish an oxide layer with an efficient removal rate to produce substantially scratch-free surface.

Finally, the polishing method described in *Luo* does not result in an efficient rate of removing the material of the oxide layer, as recited in claim 1. In each of the examples described in *Luo* at paragraphs [0033] through [0044], the removal rate of the TEOS oxide layer is zero angstroms per minute (paragraphs [0037], [0043]). *Luo*, paragraph [0015] confirms that the polishing rate at best is "very low."

Accordingly, applicants respectfully submit that the combination of references cited in the final Office Action neither teaches nor suggests the invention recited in claim 1. Similar recitations also patentably distinguish claim

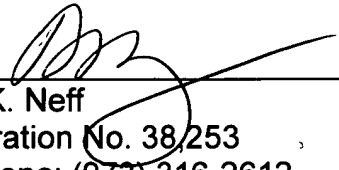
16 from the cited combination of references. Applicants further submit that claims 25 through 28 recite additional features which provide independent bases for patentably distinguishing the invention from the cited references.

Support for the present amendments is provided, *inter alia*, at paragraphs [0005], [0019], and [0024]-[0027] of the Specification.

It is respectfully submitted that the present amendments place the application in condition for allowance. In the interest of advancing the application to allowance, the Examiner is invited to telephone Applicants' attorney at the number indicated below to discuss or clarify any remaining matters that relate to the application and/or the present amendment.

It is believed that only the RCE fee of \$790.00 is due in connection of the present amendment. If any other fee is required for this amendment, please debit the Deposit Account No. 09-0458 of the Assignee International Business Machines Corporation. If there is an overpayment, please credit the same account.

Respectfully submitted,
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